

REMARKS

This amendment is being filed in response to the Office Action having a mailing date of June 6, 2005. Claims 1, 4, 8-12, and 16-20 are amended as shown. More specifically, independent claims 1, 4, 9-10, 11-12, and 16-20 are amended to recite additional distinctive subject matter. No new matter has been added. With this amendment, claims 1-20 are pending in the application.

In the Office Action, claims 1-20 were rejected under 35 U.S.C. § 112, second paragraph for being indefinite. More specifically, the Examiner stated that the limitation “ADL representation generates a representation of structure” in independent claims 1, 4, 9, and 12 was unclear. The applicant believes that this limitation does indeed meet the definiteness requirements of 35 U.S.C. § 112, second paragraph. However, to facilitate prosecution, this limitation is being removed from the above-mentioned independent claims, as well as in the other claims that contain this or similar recitations. With these amendments to the claims, the rejection under 35 U.S.C. § 112, second paragraph, is moot and/or overcome.

In the Office Action, claims 1-20 were rejected under 35 U.S.C. § 103(a) as being unpatentable over the article by Ramsey entitled “Specifying Representations of Machine Instructions” in view of Gupta (U.S. Patent No. 6,385,757). For the reasons set forth below, the applicant respectfully disagrees with these rejections and requests that the pending claims be allowed.

A disclosed embodiment will now be discussed in comparison to the applied references. Of course, the discussion of the disclosed embodiment, and the discussion of the differences between the disclosed embodiment and subject matter described in the applied references, do not define the scope or interpretation of any of the claims. Instead, such discussed differences are intended to merely help the Examiner appreciate important claim distinctions discussed thereafter.

According to one embodiment, a method is provided to automatically translate an opcode summary table into an architecture description language (ADL) that can be employed to efficiently design and test a microprocessor instruction set. The opcode summary table is made up of lines or other entries that represent a plurality of instructions. In order to create a more

compact and efficient representation of the microprocessor instructions, an ADL generator 102 is provided to scan an opcode summary table to find similarities between instructions. See, *e.g.*, page 6, line 22 through page 7, line 1 of the present application.

For example, instructions may be grouped together based on grouping criteria. One example of grouping criteria involve bit pattern similarities that are common to all of the opcode entries represented in their base group. In other words, instructions or opcodes in the opcode summary table are evaluated as a whole to identify instructions having similar bit patterns, and then such instructions having similar bit patterns are grouped together in the same group. It is possible according to an embodiment to provide subgroups and supergroups that are made up of instructions having similar bit patterns.

Example embodiments of techniques for grouping instructions and other entries from opcode tables, according to bit similarities between the instructions evaluated as a whole, are described in further detail on page 8, line 15 through page 13, line 16. As one specific and nonlimiting example, Table 2 shows a group of instructions from Table 1 that have been grouped together based on similar bit patterns. It can be noted from the group in Table 2 that the instructions were evaluated as a whole in order to find the similarities, in that all of the fields of the opcode entries were examined for similarities.

Ramsey does not disclose, teach, or suggest grouping of instructions from an opcode summary table based on: 1) bit similarities between the instructions, and/or 2) an evaluation of the instruction as a whole to identify the bit similarities. For example, the Examiner on page 8 of the Office Action has cited page 497 (Bracket 5) and page 499 (Bracket 9) of Ramsey as disclosing grouping entries of the opcode summary table in accordance with grouping criteria. However, Bracket 5 of Ramsey merely discusses use of a hierarchy of opcode tables, while Bracket 9 of Ramsey discusses a completely different type of grouping.

More particularly, Bracket 9 of Ramsey uses disjunctions of patterns to represent groupings, instead of generating groups based on bit similarities between the instructions evaluated as a whole. “Disjuncts” are “separations” and thus Ramsey appears to break up an opcode into individual separate disjuncts and then a new pattern is computed by conjoining the various disjuncted portions of the opcode and the operands. See, *e.g.*, Bracket 9 (page 499, lines

10-13) of Ramsey. Thus, in contrast to the present applicant's embodiments where instructions from the opcode summary table are evaluated as a whole to determine similar bit patterns, such that instructions having similar bit patterns are grouped together, Ramsey appears to break up opcode instructions into disjunctions of patterns, and then conjoin the disjunctions in order to compute new patterns. Nothing is mentioned in Ramsey that such disjunctions and/or conjoining are based on the instructions evaluated as a whole and/or based on bit pattern similarities. Indeed, in order to obtain the disjunctions of Ramsey, the instructions from his opcode summary table cannot be evaluated as a whole, since disjunctions require separation of the instructions into constituent parts.

Accordingly, independent claim 1 is amended to clarify that the opcode summary table has entries representing a plurality of instructions. Claim 1 is further amended to recite grouping instructions from the opcode summary table into groups according to bit similarities between the instructions evaluated as a whole. This feature is not disclosed, taught, or suggested by Ramsey. As explained above, Ramsey's grouping is based on disjunctions of patterns, rather than the recited bit similarities between the instructions evaluated as a whole. Accordingly, claim 1 is allowable over Ramsey.

Adding the reference of Gupta to Ramsey does not cure the deficiencies of Ramsey. For example, Gupta provides an "operation group" that makes it possible to specify that multiple instances of the same operation can be issued concurrently. See, *e.g.*, column 7, lines 10-13 of Gupta. However, Gupta is completely silent with regard to evaluating instructions as a whole to identify similar bit patterns so as to group instructions having similar bit patterns together. The operation group discussed in Gupta simply relates to locating multiple instances of the same operation. Accordingly, amended claim 1 is allowable over both Ramsey and Gupta, whether singly or in combination.

Independent claims 4, 9, 10, and 12 are similarly amended to recite grouping instructions from the opcode summary table into groups according to bit similarities between the instructions evaluated as a whole. As explained above, this feature is not disclosed, taught, or suggested by Ramsey and/or Gupta, whether singly or in combination. Therefore, amended independent claims 4, 9, 10, and 12 are now allowable.

Independent claim 11 is amended to recite a subgroup of instructions that have been grouped together based on bit similarities between the instructions evaluated as a whole. Again, as explained above, there is nothing disclosed, taught, or suggested in Ramsey and/or Gupta that involves grouping instructions into a group or subgroup based on bit similarities between the instructions evaluated as a whole. Therefore, amended claim 11 is now allowable over the cited references.

Independent claims 16, 17, 18, and 19 are amended to recite grouping instructions from the opcode summary into groups according to bit similarities between the instructions evaluated as a whole. Ramsey and/or Gupta do not disclose, teach, or suggest grouping instructions from an opcode summary (such as a table or other type of data structure) on the basis of bit similarities between the instructions evaluated as a whole. Ramsey bases its groupings on disjunctions of patterns and makes no mention whatsoever of performing such groupings based on bit similarities from instructions evaluated as a whole, in particular, since Ramsey involves breaking up instructions into individual disjuncts then computing a pattern by conjoining individual disjuncts. Gupta merely discusses the use of operation groups that specify that multiple instances of the same operation be issued concurrently. Accordingly, these independent claims 16, 17, 18, and 19 are allowable over the cited references.

Dependent claim 8 is amended to make its recitations consistent with its base claim. Dependent claim 20 is amended to more precisely recite the subject matter therein and to make its recitations consistent with its base claim 19. Dependent claims 8 and 20 are allowable.

Overall, none of the references singly or in any motivated combination disclose, teach, or suggest what is recited in the independent claims. Thus, given the above amendments and accompanying remarks, the independent claims are now in condition for allowance. The dependent claims that depend directly or indirectly on these independent claims are likewise allowable based on at least the same reasons and based on the recitations contained in each dependent claim.

If the undersigned attorney has overlooked a teaching in any of the cited references that is relevant to the allowability of the claims, the Examiner is requested to specifically point out where such teaching may be found. Further, if there are any informalities

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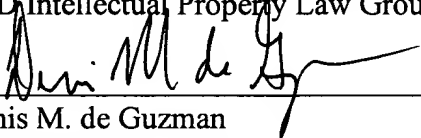
or questions that can be addressed via telephone, the Examiner is encouraged to contact the undersigned attorney at (206) 622-4900.

The Director is authorized to charge any additional fees due by way of this Amendment, or credit any overpayment, to our Deposit Account No. 19-1090.

All of the claims remaining in the application are now clearly allowable. Favorable consideration and a Notice of Allowance are earnestly solicited.

Respectfully submitted,

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